for the inner surfaces of the pharmaceutical package to shed glass particulates or "delaminate" following exposure to pharmaceutical solutions.

[0005] In addition, use of glass in pharmaceutical packaging may also be limited by the mechanical performance of the glass. Specifically, the high processing speeds utilized in the manufacture and filling of glass pharmaceutical packages may result in mechanical damage on the surface of the package, such as abrasions, as the packages come into contact with processing equipment, handling equipment, and/or other packages. This mechanical damage significantly decreases the strength of the glass pharmaceutical package resulting in an increased likelihood that cracks will develop in the glass, potentially compromising the sterility of the pharmaceutical contained in the package or causing the complete failure of the package.

[0006] Accordingly, a need exists for alternative glass containers for use as pharmaceutical packages which exhibit a combination of at least two of improved resistance to delamination, increased strength, and/or damage tolerance.

SUMMARY

[0007] ~~According to one embodiment, a~~A glass container may include a body having an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface. At least the inner surface of the body may have a delamination factor less than or equal to 10. A compressively stressed layer may extend from the outer surface of the body into the wall thickness. The compressively stressed layer may have a surface compressive stress greater than or equal to 150 MPa.

[0007a] In a first aspect, there is provided a glass container comprising:

a body having an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface, wherein at least the inner surface of the body has a delamination factor less than or equal to 10; and

a compressively stressed layer extending from the outer surface of the body into the wall thickness, the compressively stressed layer having a surface compressive stress greater than or equal to 150 MPa.

[0008] ~~According to another embodiment, a~~A glass container may include a body having an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface. At least the inner surface of the body may be formed from a Type I, Class B glass according to ASTM Standard E438-92. A compressively stressed layer may extend into the wall thickness. The compressively stressed layer may have a surface compressive stress greater than or equal to 150 MPa. A barrier coating

may be positioned on the inner surface of the body such that a composition contained in the glass container contacts the barrier coating and not the inner surface of the body.

[0008a] In a second aspect, there is provided a glass container comprising:

a body having an inner surface, an outer surface and a wall thickness extending from the outer surface to the inner surface, wherein the body is formed from a glass composition which is free from constituent components which form species that volatilize significantly at temperatures corresponding to a viscosity in a range from about 200 poise to about 100 kilopoise; and

a compressively stressed layer extending from the outer surface of the body into the wall thickness, the compressively stressed layer having a surface compressive stress greater than or equal to 150 MPa.

[0009] ~~According to another embodiment, a~~A glass container may include a body having an inner surface, an outer surface and a wall thickness extending from the outer surface to the inner surface. The body may be formed from a glass composition which is free from constituent components which form species that volatilize significantly at temperatures corresponding to a viscosity in a range from about 200 poise to about 100 kilopoise. A compressively stressed layer may extend from the outer surface of the body into the wall thickness. The compressively stressed layer may have a surface compressive stress greater than or equal to 150 MPa.

[0009a] In a third aspect, there is provided a glass container comprising:

a body having an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface, wherein the body is formed from a Type I, Class B glass according to ASTM Standard E438-92 and the body is formed under processing conditions which mitigate the vaporization of volatile species in the glass composition; and

a compressively stressed layer extending from the outer surface of the body into the wall thickness, the compressively stressed layer having a surface compressive stress greater than or equal to 150 MPa.

[0010] According to another embodiment, a glass container may include a body having an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface. The body is formed from a Type I, Class B glass according to ASTM Standard E438-92 under processing conditions which mitigate the vaporization of volatile species in the glass composition. A compressively stressed layer may extend from the outer surface of the body into the wall thickness. The compressively stressed layer may have a surface compressive stress greater than or equal to 150 MPa.

[0011] Additional features and advantages of the embodiments of the glass containers described herein will be set forth in the detailed description which follows, and in part will be readily apparent to those skilled in the art from that description or recognized by practicing the embodiments described herein, including the detailed description which follows, the claims, as well as the appended drawings.

[0012] It is to be understood that both the foregoing general description and the following detailed description describe various embodiments and are intended to provide an overview or framework for understanding the nature and character of the claimed subject matter. The accompanying drawings are included to provide a further understanding of the various embodiments, and are incorporated into and constitute a

10. The glass container of any of claims 1 through 3, wherein the body has either:

(a) at least a class S3 acid resistance or better according to DIN 12116;

at least a class A2 base resistance or better according to ISO 695; and

at least a type HgB2 hydrolytic resistance or better according to ISO 719; and

at least a type HgA2 hydrolytic resistance or better according to ISO 720; orand

(b) a Type 1 chemical durability according to USP <660>.